

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (currently amended): A method for fabricating a multi-bit vertical memory cell, comprising:

- providing a semiconductor substrate having a trench;
- forming doped areas, acting as bit lines, in the semiconductor substrate near its surface and the bottom of the trench;
- forming bit line insulating layers simultaneously by thermal oxidation over each of the doping doped areas;
- forming a conformable oxide layer over a sidewall of the trench and the bit line insulating layers to locally store electric charge; and
- forming a conducting layer over the insulating conformable layer and filling in the trench.

Claim 2 (currently amended): The method for fabricating a multi-bit vertical memory cell of claim 1, a fabricating method of the doping doped areas further comprising:

- forming a spacer over the sidewall of the trench;
- performing ion implantation in the substrate using the spacer as a mask; and
- removing the spacer.

Claim 3 (original): The method for fabricating a multi-bit vertical memory cell of claim 2, wherein the spacer is silicon nitride.

Claim 4 (original): The method for fabricating a multi-bit vertical memory cell of claim 2, wherein phosphorous ions are implanted.

Claim 5 (canceled)

Claim 6 (original): The method for fabricating a multi-bit vertical memory cell of claim 1, wherein the thicknesses of the bit line insulating layers are 300 to 2000Å.

Claim 7 (currently amended): The method for fabricating a multi-bit vertical memory cell of claim 1, wherein the conformable oxide layer is a silicon rich oxide layer.

Claim 8 (currently amended): The method for fabricating a multi-bit vertical memory cell of claim 1, wherein the thickness of the conformable oxide layer is 50 to 110Å.

Claim 9 (currently amended): The method for fabricating a multi-bit vertical memory cell of claim 1, further comprising a gate dielectric layer between the conformable oxide layer and the trench surface.

Claim 10 (original): The method for fabricating a multi-bit vertical memory cell of claim 9, wherein the gate dielectric layer is a gate oxide layer.

Claim 11 (original): The method for fabricating a multi-bit vertical memory cell of claim 9, wherein the thickness of the gate dielectric layer is 50Å.

Claim 12 (original): The method for fabricating a multi-bit vertical memory cell of claim 1, wherein the conducting layer is a poly layer.

Claims 13-20 (canceled)